

## ATTACHMENT 4

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### 4.0 PROJECT DESCRIPTION

#### 4.1. Project 1 – Development of a Ground Water Management Plan (GWMP)

It is proposed to prepare a ground water management plan for the Banning Storage Units of the San Gorgonio Pass Ground Water Subbasins. The State of California Department of Water Resources (DWR) has designated the San Gorgonio Pass Ground Water Subbasin as Basin Number 7-21.04 in DWR Bulletin 118. The San Gorgonio Pass Ground Water Subbasin is one of four subbasins which form the Coachella Valley Ground Water Basin. Subsequent to the initial mapping of the San Gorgonio Pass Ground Water Subbasin, Bloyd (1971) subdivided the San Gorgonio Pass Ground Water Subbasin into storage units which included the Banning and Banning Bench Ground Water Storage Units. More recently, USGS (2006) has further delineated and refined storage unit boundaries as shown on the attached Figure 1.

The Storage Units to be included in the ground water management plan consist of Banning Canyon, Banning Bench, and Banning Storage Units. The San Gorgonio Pass Ground Water Subbasin also includes a portion of Beaumont Storage Unit, located to the west of Banning, and the Cabazon Storage Unit located to the east. All of the storage units are located in Riverside County, California. Although the City of Banning extracts ground water from the Beaumont Basin, the Beaumont Basin (storage unit) is adjudicated and the City extracts its court mandated supply, as well as water in storage from recharge of State Water Project water purchased from the San Gorgonio Pass Water Agency.

Management of the ground water supplies in the Banning Storage Units is essential. In 2010 approximately 67 percent of the water supplied to the City's population comes from these storage units. The municipal and industrial (M&I), and irrigation demands rely exclusively on ground water and constitute an estimated 16 percent of total pumpage from the storage units. Should demand patterns remain consistent, basin pumpage is expected to approach sustainable yield in the next five years. Since ground water is by far the most important water supply for the City and its sphere of influence, management of the ground water supplies through a state compliant GWMP is a necessary part of the next step of ground water management for those storage units.

The City continues its efforts to manage ground water in a sustainable manner. The City is investigating ground water recharge projects using stormwater run-off, recycled water, and imported water (see Project 2 description below). The City works cooperatively with Banning Heights Mutual Water Company, the only other water purveyor using the Banning Bench Storage Unit, to manage the ground water supplies. The City is in discussions with Riverside County Flood Control and Water Conservation

District to cooperatively plan and implement a recharge project, which meets the mission of both agencies, for surface water conservation and development of ground water supplies.

#### 4.1.1. Purpose and Goals

The purposes of the GWMP include:

- Build upon an existing cooperation within the storage units and further explore ground water management opportunities in the storage units for long-term sustainability of ground water supply.
- Formulate ground water management components to reflect the available information that emphasize the ground water management aspects within the storage units.
- Identify projects and programs that can be implemented to improve long-term water supply reliability in the Banning Storage Units.
- Establish an approach to ground water management that is accepted in the storage units both now, and in the future that will be recognized by other local, state, and federal agencies, and can be used successfully to pursue grant funding to implement projects that support improved ground water management.

The project goals include:

- To provide current and future Stakeholders an understanding of the state of the storage units and the opportunity to keep these storage units in balance avoiding ground water overdraft conditions.
- Complete and adopt the GWMP, with storage unit specific Basin Management Objectives (BMOs).
- Expand the existing ground water monitoring program and annual reporting format for the GWMP area to be consistent with current DWR reporting recommendations (CASGEM).
- Develop management practices within the Banning Storage Units, both near term and long term, thus allowing an outworking of the projected water supply reported in the UWMP.

#### 4.1.2. Current Ground Water Management Activities

The City of Banning manages the ground water supply in the Banning Storage Units through monthly recordation of extractions and monitoring of ground water levels in the storage units. An annual reporting of ground water extractions is reported to DWR. Ground water elevations are recorded as part of the proposed work which will be submitted as part of the CASGEM program per SBx7.

##### City of Banning 2010 Urban Water Management Plan

The Urban Water Management Plan (UWMP) describes the City's current and future water demands, identifies current water supply sources, and assesses supply reliability for the City. The UWMP describes the City's reliance on ground water and its support of efforts to avoid overdraft by developing additional sources. These sources include water conservation, recharge from stormwater capture projects, and the use of recycled water for irrigation.

##### City of Banning Recycled Water Master Plan

The Recycled Water Master Plan includes an analysis of potential available recycled water to the City and proposed options for replacing potable water with recycled water for use throughout the City. Currently, secondary treated wastewater is recharged into the Cabazon Storage Unit via the City of Banning Wastewater Treatment Facility. The City is in process of considering options for smaller satellite tertiary wastewater treatment plants to use and recharge treated wastewater in the Banning Storage Units. The second proposed project presented herein will further explain the process of selecting an appropriate recharge site for both stormwater and tertiary treated wastewater which will further add to the management of water supplies within the Banning Storage Units.

##### City of Banning Determination of Maximum Perennial Yield

The maximum perennial yield was updated in 2010 in anticipation of completion of the 2010 UWMP. Maximum perennial yield is defined as the maximum amount of ground water that can be extracted on an average annual basis without causing environmental damage or adverse impacts. The study included analysis of ground water storage units within the City of Banning water resource area, including the watershed area encompassing the Banning, Banning Bench, Banning Canyon and Cabazon Storage Units. The maximum perennial yield is a function of the amount of ground water recharge that the aquifers receive from precipitation, underflow, artificial recharge, local irrigation and return flows on an average annual basis. In order to maintain successful management of the Banning Storage Units these values should be confirmed through further study and used as a reference for extraction maximums.

#### 4.2. Project 2 – Ground Water Recharge Feasibility Study

The ground water recharge feasibility study (GWRFS) will consist of a comprehensive update and assimilation of geologic and geohydrologic data for the Banning Storage Units to prepare a watershed model and refine the existing USGS ground water flow and solute transport model of the Banning Storage Units. The models will become a valuable tool to evaluate ground water recharge using captured stormwater, recycled water or imported water for potential recharge sites, as well as long-term salt and nutrient management in the Banning Storage Units. The GWRFS will also include recommendations for site specific field investigations including, technical specifications for exploratory drilling and test well construction and testing, and pilot basin construction and testing protocol.

The City of Banning is interested in identifying areas of potential conjunctive use spreading and extraction of surface and ground water within the Banning Storage Units. The GWRFS area for this project includes the Banning, Banning Bench, and Banning Canyon Storage Units as shown on Figure 1. The Banning Storage Units are part of the San Geronio Pass Ground Water Subbasin. The boundary of the San Geronio Pass Ground Water Subbasin is also shown on Figure 1 in relation to the Banning Storage Units.

##### 4.2.1. Purpose and Goals

The primary purpose of the project is to identify the means to meet anticipated water demands for planned growth while maintaining the health of the ground water storage units.

The purposes of the GWRFS:

- To assemble all geologic and geohydrologic data for the Banning Storage Units.
- Evaluate potential volumes of storm water capture, recycled water, and imported water available for ground water recharge in the Banning Storage Units.
- To develop a comprehensive hydrologic tool using up to date industry standard models to use for ground water management.

The project goals include:

- Review existing geologic and geohydrologic conceptual model of the existing ground water model based on current data.
- Refine and calibrate ground water flow and solute transport model for the Banning Storage Units.

- Evaluate the impact on ground water levels and ground water quality conditions from potential recharge projects in selected portions of the Banning Storage Units.
- Use of the ground water model as a ground water management tool for selected conjunctive use projects and to evaluate potential future projects with regard to conformance with the Banning Storage Unit BMOs.

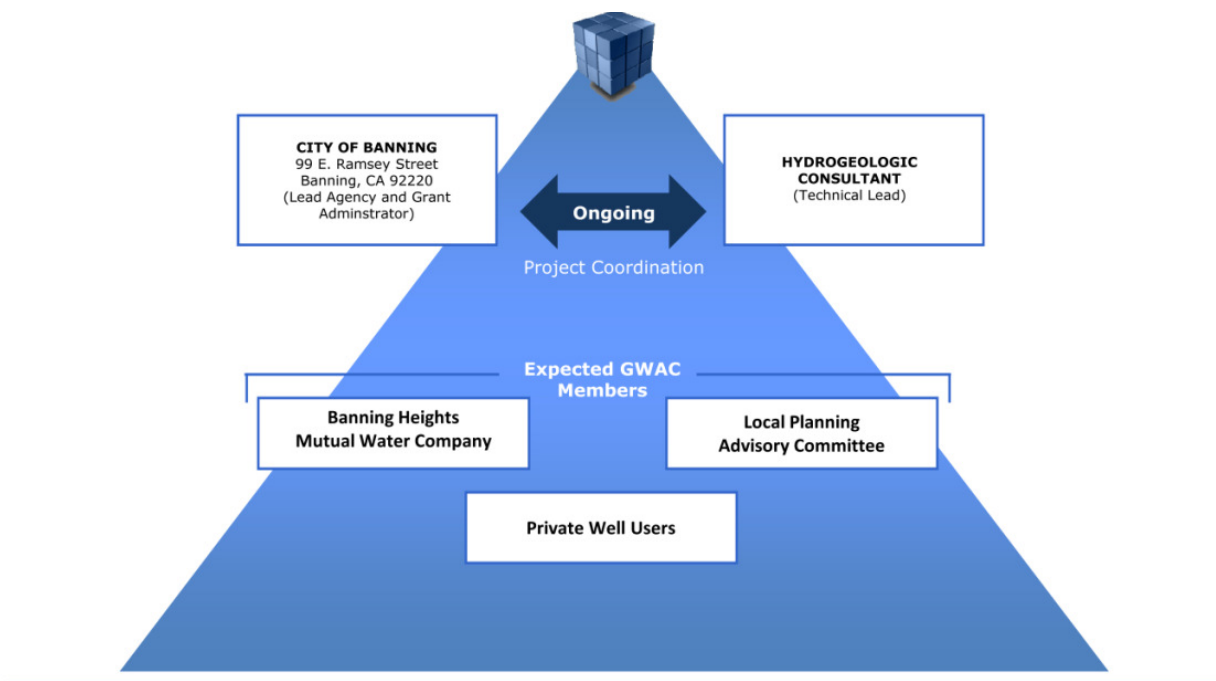
#### 4.2.2. Current Recharge Activities

Currently, ground water recharge of storm flows and recycled water is not occurring within the Banning Storage Units. However, ground water recharge occurs in Banning Canyon as a result of water rights diversion from the Whitewater River. Diversion of surface water from the upper reaches of the Whitewater River into Banning Canyon (Banning Canyon Storage Unit) was initiated in 1913. The diverted water flows along steep mountain slopes for approximately 14 miles in a mostly concrete lined conveyance system known as the Flume (see Figure 1). Portions of the flume had significantly deteriorated over the years but are planned for repair. Along the flume system, Southern California Edison historically operated two powerhouses to generate hydroelectric power. Banning Heights Mutual Water Company utilizes approximately 1,000 acre-ft/year from below the second powerhouse (see Figure 2). The remainder of the diverted water flows into the San Gorgonio River below the Banning Heights Mutual Water Company abstraction point. Flows had diminished since the 1980's due to a loss of canal system capacity due to deterioration (C.M. Engineering Associates, 1978; San Gorgonio Pass Water Agency, 2002). Since 1961, on average, 1,500 acre-ft/year had been diverted into the Canyon Storage Unit from the Whitewater River (San Gorgonio Pass Water Agency, 2002). Currently, due to damage along sections of the flume, surface flow is diverted into Burnt Canyon to the north and then back to the Flume upstream of Powerhouse No. 1 where it continues downstream through Powerhouse No. 2 to the reservoir operated by Banning Heights Mutual Water Company. It is uncertain exactly how much of the diverted water is currently recharged into the aquifer of the Canyon Storage Unit as the flows are not metered (personal communication with Mr. Perry Gerdes, 2010).

Additionally, ground water recharge currently takes place through natural percolation of surface runoff primarily in Banning Canyon Storage Unit from the San Gorgonio River, which is the most significant surface water in the vicinity. Percolation of surface flows also occurs in Smith Creek (see Figure 2) within the Banning Storage Units.

#### 4.3. Public Process Cooperation (Project 1 and Project 2)

The GWMP and GWRFS will be developed through an open and public process to provide local ground water users, Banning Heights Water Company, Stakeholders, and interested parties, the opportunity to participate. Figure 3 presents the organization chart for the development of Project 1 and Project 2.



GWAC – Ground Water Advisory Committee  
Figure 3 - Organization Chart

The projects will be developed based on input from local ground water users, Banning Heights Water Company, Stakeholders, and interested parties. The City is the lead agency, both for submitting this grant application and providing contract administration. The preparation of the projects will follow the approach that has been successful in development of the UWMP, which includes utilizing the resources of the City to lead the technical analysis. The process to develop these projects include:

- Inviting and encouraging public participation.
- Conducting workshops for interested parties.
- Forming the Banning Storage Units Ground Water Advisory Committee (Banning Storage Units GWAC) of interested parties and Stakeholders.

- Holding regularly scheduled meetings of the Banning Storage Units GWAC, to guide the development of the projects and to provide information to other Stakeholders and interested parties about the progress being made.

The proposed projects require coordinated and regular communication among all Stakeholders in the storage units. Therefore, all local Stakeholders will be invited to participate in the process through personal contacts, public notices through local newspapers, and local neighborhood committees.

#### 4.4. Ongoing Use

##### 4.4.1. Project 1

The information developed from this project will be used to develop a current baseline set of data to be used in conjunction with second part of this project (Ground Water Recharge project including development of a ground water model for the storage units). Overall, the information developed will form the basis for future planning and management of an essential water supply for the City of Banning. The data collection and management efforts will continue to be funded by the City, as they have been in the past. Additional funding may be pursued for specific projects such as stormwater capture and recycled water pilot projects investigations. The following list identifies some of the future uses for the information developed during this project:

- The ground water monitoring program will use production wells from selected voluntary participants. The proposed monitoring program will be expanded to include fill data gaps in order to provide area wide on-going monitoring of ground water conditions.
- The basin-wide ground water level data will be used in future ground water management efforts such as monitoring the effectiveness of conjunctive use operations.
- The ground water data from the ongoing ground water monitoring efforts will be incorporated into the data management system developed as part of this project to produce annual ground water reports. This will support and streamline future monitoring and reporting efforts.
- The SB 1938 GWMP will continue to be implemented and maintained. The Banning Storage Units GWAC will continue to lead the ground water management effort.

#### 4.4.2. Project 2

The GWRFS will result in the preparation of a ground water management tool that can be used long-term for ground water management planning. The watershed and refined ground water model can be updated with advent of additional data and as the project area changes in the future and in accordance with developing long-term water management strategies.

#### 4.5. Information Dissemination (Project 1 and Project 2)

During the projects, the consultant will provide monthly status reports by e-mail to the Committee on the progress of work. As the lead agency, the City will review and forward these e-mails to DWR. Information about the projects will also be available at six project meetings proposed for the projects. The dates and times of the workshops will be provided to the Stakeholders and project participants and also be posted on the City's website at <http://www.ci.banning.ca.us>.

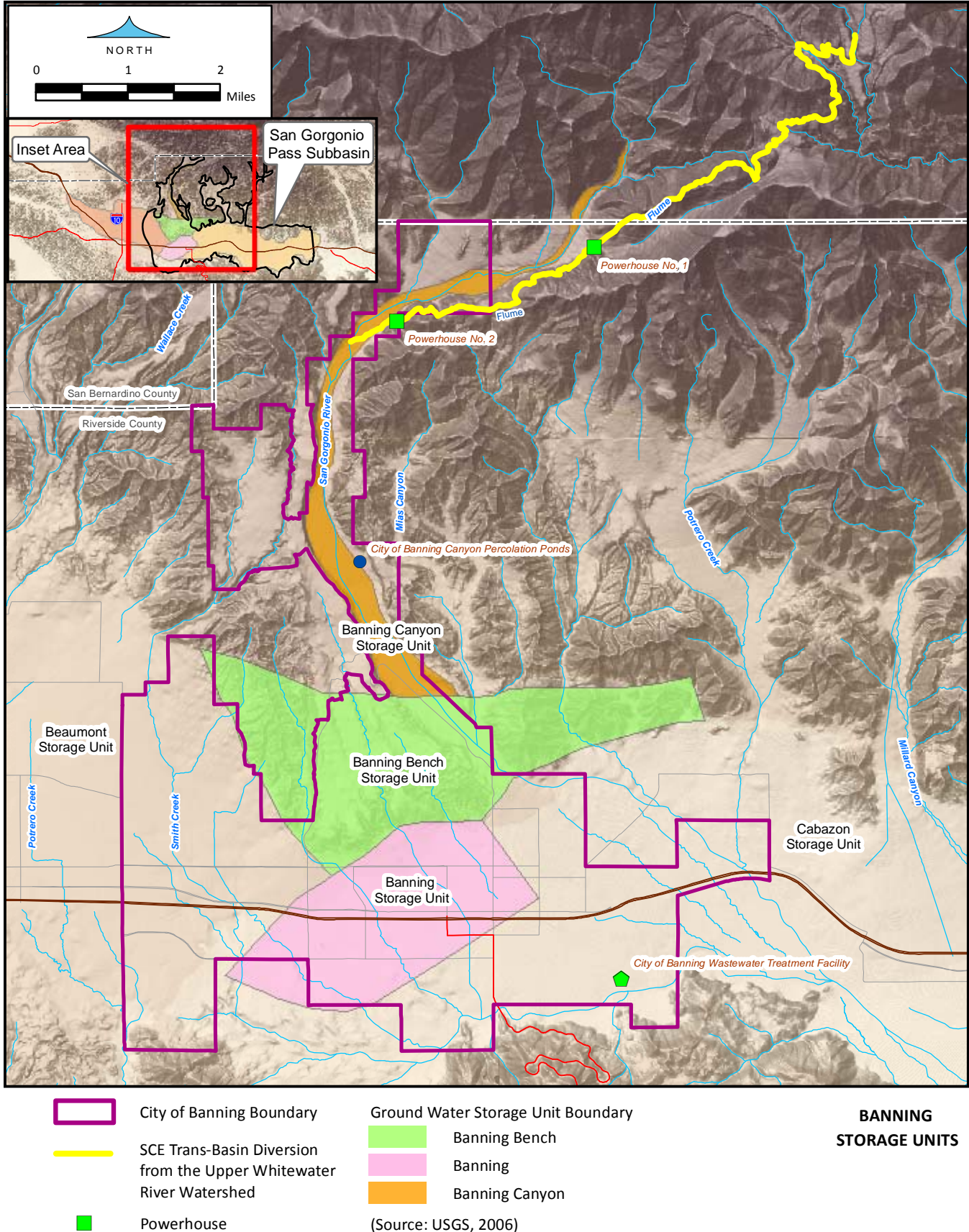
The City will prepare and distribute to DWR quarterly progress reports. Preliminary dates for submittal of the progress reports are shown on the project schedule in Task 6 of Project 1 and as defined in Project Deliverables for Project 1 and Project 2.

Upon completion of the projects, the final GWMP and GWRFS will be distributed to basin Stakeholders, participants, and DWR. A hard copy will be available for review at the City, the County, and at the local library. Electronic versions of the will be available on the City's website.



PROPOSAL FOR DEVELOPMENT OF A GROUND WATER  
MANAGEMENT PLAN AND GROUND WATER RECHARGE FEASIBILITY STUDY FOR THE  
BANNING GROUND WATER STORAGE UNITS, CITY OF BANNING, RIVERSIDE COUNTY, CA

CITY OF BANNING



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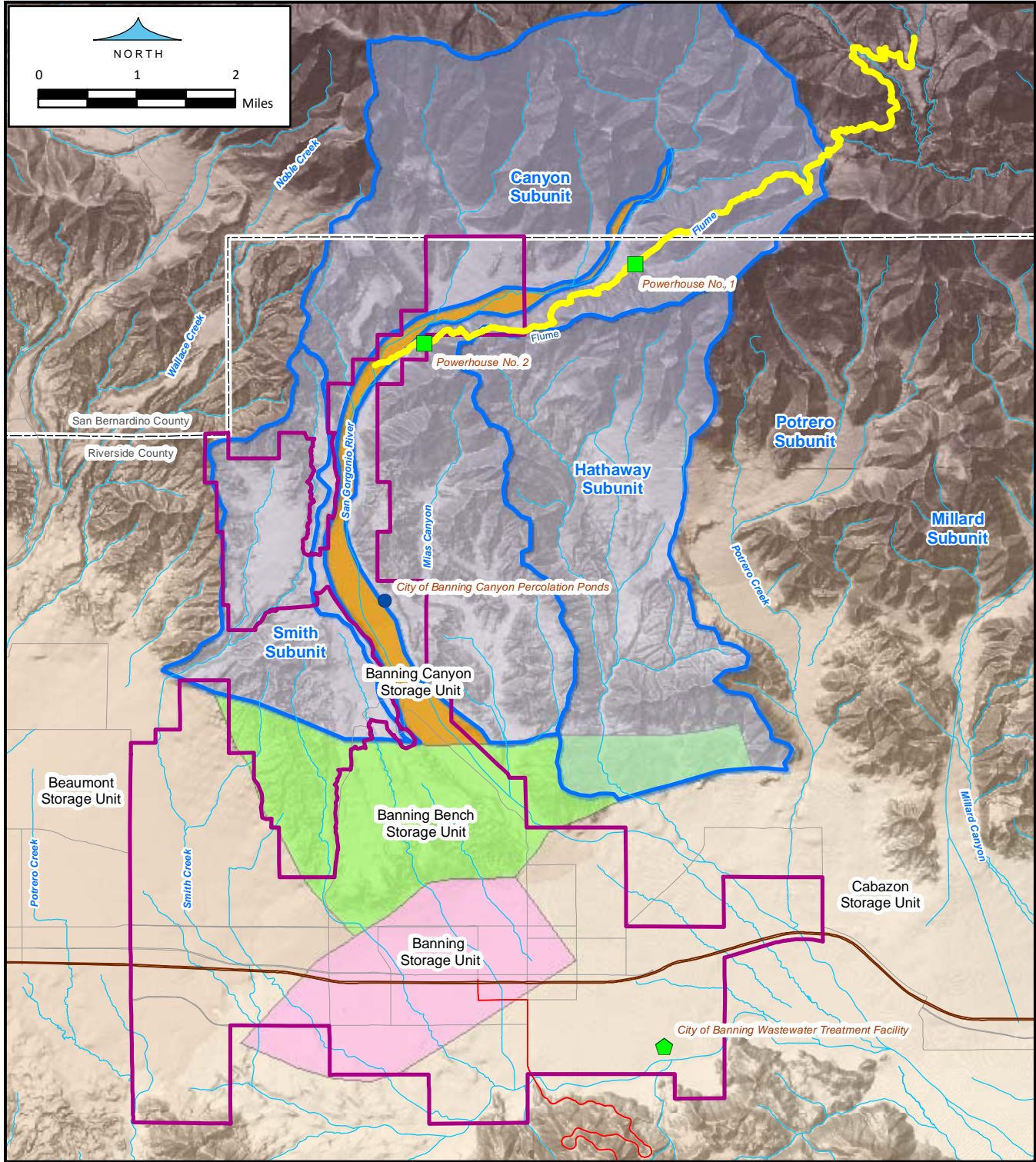
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**Figure 1**



PROPOSAL FOR DEVELOPMENT OF A GROUND WATER  
MANAGEMENT PLAN AND GROUND WATER RECHARGE FEASIBILITY STUDY FOR THE  
BANNING GROUND WATER STORAGE UNITS, CITY OF BANNING, RIVERSIDE COUNTY, CA

CITY OF BANNING



- City of Banning Boundary
- SCE Trans-Basin Diversion from the Upper Whitewater River Watershed
- Powerhouse

- Banning Bench
- Banning
- Banning Canyon

(Source: USGS, 2006)

- Hydrologic Subunit Boundary

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**Figure 2**